



SEQUENCE LISTING

<110> BERGSTROM, Sven

<120> P13 ANTIGENS FROM BORRELIA

<130> 454312-3150

<140> 09/508,487

<141> 2000-03-10

<150> 60/059,036

<151> 1997-09-10

<150> 1041/97

<151> 1997-09-10

<150> PCT/IB98/01424

<151> 1998-09-04

<160> 31

<170> PatentIn Ver. 2.1

<210> 1

<211> 25

<212> PRT

<213> Borrelia burgdorferi

<400> 1

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1

5

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15

Gly Phe Gly Ile Gly Ser Phe Ala Gln

20

25

<210> 2

<211> 20

<212> DNA

<213> Borrelia burgdorferi

<220>

<221> variation

<222> (1)..(20)

<223> N stands for any nucleic acid

<220>

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TECH CENTER 1600/2900

<221> variation
<222> (1)..(20)
<223> R stands for G or A

<220>
<221> variation
<222> (1)..(20)
<223> Y stands for T/U or C

<400> 2
acntcnaarc argayccnat

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<210> 3
<211> 20
<212> DNA
<213> Borrelia burgdorferi

<220>
<221> variation
<222> (1)..(20)
<223> N stands for any nucleic acid

<220>
<221> variation
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<223> R stands for G or A

<220>
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<223> D stands for A or G or T/U

<400> 3
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<210> 4
<211> 74
<212> DNA
<213> Borrelia burgdorferi

<400> 4
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gggagctcg ccca

74

<210> 5

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Bent

<211> 34

<212> DNA

<213> Borrelia burgdorferi

<400> 5

tgtaccatct ttattgaacc tttttttagg gttt

34

<210> 6

<211> 26

<212> DNA

<213> Borrelia burgdorferi

<400> 6

aaaccctaaa aaaaggttca ataaag

26

Beant <210> 7

<211> 26

<212> DNA

<213> Borrelia burgdorferi

<400> 7

gatttttcat tggatcccag aatttg

26

<210> 8

<211> 26

<212> DNA

<213> Borrelia burgdorferi

<400> 8

ctataccaac cgaattcaaa tccaag

26

<210> 9

<211> 21

<212> DNA

<213> Borrelia burgdorferi

<400> 9

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21

<210> 10

<211> 25

<212> DNA

<213> Borrelia burgdorferi

<400> 10
tatgctacca tggatccagt tttaa

25

<210> 11
<211> 31
<212> DNA
<213> Borrelia burgdorferi

<400> 11
cgggatccgt tttttctagc tttgctcaag c

31

<210> 12
<211> 50
<212> DNA
<213> Borrelia burgdorferi

Beant
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<210> 13
<211> 25
<212> DNA
<213> Borrelia burgdorferi

<400> 13
taaaaaaatt taaagaaaag gaggg

25

<210> 14
<211> 27
<212> DNA
<213> Borrelia burgdorferi

<400> 14
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27

<210> 15
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<213> Borrelia burgdorferi

<400> 15
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24

<210> 16
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<400> 16
 cacccatttt ctagataaat aaaattaata gc 32

<210> 17
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 <212> DNA
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<400> 17
 ataaaaggta ccatagcttt ttttgaaaga cag 33

Boat

<210> 18
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 <213> Borrelia burgdorferi

<220>
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 <222> (170)..(709)

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 aatttcatta atatgctacc atagtaccag ttttaataaa ggggttttt atg aat aaa 178
 Met Asn Lys
 1

ctt tta att ttt gtt ttg gca acc ttt tgt gtt ttt tct agc ttt gct 226
 Leu Leu Ile Phe Val Leu Ala Thr Phe Cys Val Phe Ser Ser Phe Ala
 5 10 15

caa gct aat gat tct aaa aat ggt gcg ttt ggg atg agt gct gga gaa 274
 Gln Ala Asn Asp Ser Lys Asn Gly Ala Phe Gly Met Ser Ala Gly Glu
 20 25 30 35

aaa ctt ttg gtt tat gaa act agc aag caa gat cct att gta cca ttt 322
 Lys Leu Leu Val Tyr Glu Thr Ser Lys Gln Asp Pro Ile Val Pro Phe

40

45

50

tta ttg aac ctt ttt tta ggg ttt gga ata ggc tcc ttt gct caa gga 370
 Leu Leu Asn Leu Phe Leu Gly Phe Gly Ile Gly Ser Phe Ala Gln Gly
 55 60 65

gat att ctt gga ggt tct ctt att ctt gga ttt gat gcg gtt ggt ata 418
 Asp Ile Leu Gly Gly Ser Leu Ile Leu Gly Phe Asp Ala Val Gly Ile
 70 75 80

ggg ctt ata ctt gcg ggg gct tat ttg gat atc aaa gcg ctt gat ggt 466
 Gly Leu Ile Leu Ala Gly Ala Tyr Leu Asp Ile Lys Ala Leu Asp Gly
 85 90 95

att act aaa aaa gct gct ttt caa tgg act tgg ggt aag gga gtt atg 514
 Ile Thr Lys Lys Ala Ala Phe Gln Trp Thr Trp Gly Lys Gly Val Met
 100 105 110 115

tta gca ggt gtg gtt act atg gct gtg aca aga tta aca gaa att att 562
 Leu Ala Gly Val Val Thr Met Ala Val Thr Arg Leu Thr Glu Ile Ile
 120 125 130

ctt cca ttt aca ttt gct aat agt tat aat agg aag cta aaa aat agc 610
 Leu Pro Phe Thr Phe Ala Asn Ser Tyr Asn Arg Lys Leu Lys Asn Ser
 135 140 145

ctt aat gta gct tta gga gga ttt gaa cct agt ttt gat gtt gca atg 658
 Leu Asn Val Ala Leu Gly Gly Phe Glu Pro Ser Phe Asp Val Ala Met
 150 155 160

ggc caa tcc agt gct ctt ggg ttt gaa ctg tct ttc aaa aaa agc tat 706
 Gly Gln Ser Ser Ala Leu Gly Phe Glu Leu Ser Phe Lys Lys Ser Tyr
 165 170 175

taa ttttatttat tacaaaaatg ggtgattgca attctgtatt gaaatgggtg 759

180

<210> 19

<211> 179

<212> PRT

<213> Borrelia burgdorferi

<400> 19

Met Asn Lys Leu Leu Ile Phe Val Leu Ala Thr Phe Cys Val Phe Ser
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 Ala Gly Glu Lys Leu Leu Val Tyr Glu Thr Ser Lys Gln Asp Pro Ile
 35 40 45
 Val Pro Phe Leu Leu Asn Leu Phe Leu Gly Phe Gly Ile Gly Ser Phe
 50 55 60
 Ala Gln Gly Asp Ile Leu Gly Gly Ser Leu Ile Leu Gly Phe Asp Ala
 65 70 75 80
 Val Gly Ile Gly Leu Ile Leu Ala Gly Ala Tyr Leu Asp Ile Lys Ala
 85 90 95
 Leu Asp Gly Ile Thr Lys Lys Ala Ala Phe Gln Trp Thr Trp Gly Lys
 100 105 110
 Gly Val Met Leu Ala Gly Val Val Thr Met Ala Val Thr Arg Leu Thr
 115 120 125
 Glu Ile Ile Leu Pro Phe Thr Phe Ala Asn Ser Tyr Asn Arg Lys Leu
 130 135 140
 Lys Asn Ser Leu Asn Val Ala Leu Gly Gly Phe Glu Pro Ser Phe Asp
 145 150 155 160
 Val Ala Met Gly Gln Ser Ser Ala Leu Gly Phe Glu Leu Ser Phe Lys
 165 170 175
 Lys Ser Tyr

<210> 20
 <211> 862
 <212> DNA
 <213> Borrelia afzelii

<220>
 <221> CDS
 <222> (219)..(755)

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 aattgaaatt gctaatttta tgggtcaaattc aagaagctct attgggaagc gaatttcaag 120
 taatactttg aaaaaagtta aatttaaata gttttaaaaa ctttttttaa atttcattaa 180
 tatgttacta taataccagt ttaataaaag aggttttt atg aat aaa ttt tta att 236
 Met Asn Lys Phe Leu Ile
 1 5

gtt gtt ttg cta gcc ttt tgt gtt ttt tct agc ttt gct caa gct gat 284
 Val Val Leu Leu Ala Phe Cys Val Phe Ser Ser Phe Ala Gln Ala Asp
 10 15 20
 gat tct aaa agc gct ttt aat ttg gga gcg gga gaa aaa ctt tta gct 332

Asp Ser Lys Ser Ala Phe Asn Leu Gly Ala Gly Glu Lys Leu Leu Ala
 25 30 35
 tat gaa act agt aag aaa gat cct att gtg cca ttt tta ttg aac ctt 380
 Tyr Glu Thr Ser Lys Lys Asp Pro Ile Val Pro Phe Leu Leu Asn Leu
 40 45 50
 ttt tta ggg ttt gga ata ggt tct ttt gct caa gga gat att ctt ggg 428
 Phe Leu Gly Phe Gly Ile Gly Ser Phe Ala Gln Gly Asp Ile Leu Gly
 55 60 65 70
 ggt ttt ctt att ctt gga ttt gat gca gtt ggt ata ggg tta ata ctt 476
 Gly Phe Leu Ile Leu Gly Phe Asp Ala Val Gly Ile Gly Leu Ile Leu
 75 80 85
 aca gga gct tat tta gat atc aaa gct ctt gat aag aat gct cca aaa 524
 Thr Gly Ala Tyr Leu Asp Ile Lys Ala Leu Asp Lys Asn Ala Pro Lys
 90 95 100
 gcc gct ttt aag tgg act tgg ggt aag gga atg atg ttg gca ggt gca 572
 Ala Ala Phe Lys Trp Thr Trp Gly Lys Gly Met Met Leu Ala Gly Ala
 105 110 115
 gtt act atg gct gtg aca aga ttg aca gaa att att att ccg ttt aca 620
 Val Thr Met Ala Val Thr Arg Leu Thr Glu Ile Ile Ile Pro Phe Thr
 120 125 130
 ttt gct aat agt tat aat agg aaa ctg aaa aat agc ctt aat ata gct 668
 Phe Ala Asn Ser Tyr Asn Arg Lys Leu Lys Asn Ser Leu Asn Ile Ala
 135 140 145 150
 ttt gga ggg ttt gag cct agt ttt gat att aat atg ggc caa gct agc 716
 Phe Gly Gly Phe Glu Pro Ser Phe Asp Ile Asn Met Gly Gln Ala Ser
 155 160 165
 gct ctt ggg ttt gaa cta tct ttc aaa aaa agt tat taa ttttatttta 765
 Ala Leu Gly Phe Glu Leu Ser Phe Lys Lys Ser Tyr
 170 175
 ttattaaaat gagt gatagc aattttgtat tgtgattgct cattgtaatt gaaaattaga 825
 gctttttgttt attatttata ttttatttct ctgctaa 862

<210> 21

<211> 178

<212> PRT

<213> Borrelia afzelii

<400> 21

Met Asn Lys Phe Leu Ile Val Val Leu Leu Ala Phe Cys Val Phe Ser
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20 25 30
Gly Glu Lys Leu Leu Ala Tyr Glu Thr Ser Lys Lys Asp Pro Ile Val
35 40 45
Pro Phe Leu Leu Asn Leu Phe Leu Gly Phe Gly Ile Gly Ser Phe Ala
50 55 60
Gln Gly Asp Ile Leu Gly Gly Phe Leu Ile Leu Gly Phe Asp Ala Val
65 70 75 80
Gly Ile Gly Leu Ile Leu Thr Gly Ala Tyr Leu Asp Ile Lys Ala Leu
85 90 95
Asp Lys Asn Ala Pro Lys Ala Ala Phe Lys Trp Thr Trp Gly Lys Gly
100 105 110
Met Met Leu Ala Gly Ala Val Thr Met Ala Val Thr Arg Leu Thr Glu
115 120 125
Ile Ile Ile Pro Phe Thr Phe Ala Asn Ser Tyr Asn Arg Lys Leu Lys
130 135 140
Asn Ser Leu Asn Ile Ala Phe Gly Gly Phe Glu Pro Ser Phe Asp Ile
145 150 155 160
Asn Met Gly Gln Ala Ser Ala Leu Gly Phe Glu Leu Ser Phe Lys Lys
165 170 175
Ser Tyr

<210> 22

<211> 749

<212> DNA

<213> Borrelia garinii

<220>

<221> CDS

<222> (192) .. (725)

<400> 22

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aatagttcca aaagcctttt ttaaatttca ttaatatgct accataatac cagttttaata 180
aagggggtttt t atg aat aag ttt tta att ttt att ttg gta atc ttt tgt 230
Met Asn Lys Phe Leu Ile Phe Ile Leu Val Ile Phe Cys
1 5 10

gct ttt tct agt ttt gct caa gat gat tct aaa agc act ttt aat ctg 278
 Ala Phe Ser Ser Phe Ala Gln Asp Asp Ser Lys Ser Thr Phe Asn Leu
 15 20 25

gga gcg gga gaa aaa ttt ttg gtt tat gaa act aat aag aaa gat tct 326
 Gly Ala Gly Glu Lys Phe Leu Val Tyr Glu Thr Asn Lys Lys Asp Ser
 30 35 40 45

ctt gta cca ttt tta ttg aac ctt ttt tta ggg ttc ggg ata ggt tct 374
 Leu Val Pro Phe Leu Leu Asn Leu Phe Leu Gly Phe Gly Ile Gly Ser
 50 55 60

ttt gct caa gga gat atc ctt gga ggt tct ctt att ctt gga ttt gat 422
 Phe Ala Gln Gly Asp Ile Leu Gly Gly Ser Leu Ile Leu Gly Phe Asp
 65 70 75

gcg gtt ggt ata ggg tta ata ctt aca gga gct tat ttg gac atc aag 470
 Ala Val Gly Ile Gly Leu Ile Leu Thr Gly Ala Tyr Leu Asp Ile Lys
 80 85 90

gat ttt gat aat aat gct aaa aaa gct gat ttt aag tgg act tgg ggt 518
 Asp Phe Asp Asn Asn Ala Lys Lys Ala Asp Phe Lys Trp Thr Trp Gly
 95 100 105

aag gga atg atg ttg gca ggt gtg gtt act atg gct gtg aca aga ttg 566
 Lys Gly Met Met Leu Ala Gly Val Val Thr Met Ala Val Thr Arg Leu
 110 115 120 125

aca gaa att gtt ctt cca ttt aca ttt gct aat aat tat aac agg aag 614
 Thr Glu Ile Val Leu Pro Phe Thr Phe Ala Asn Asn Tyr Asn Arg Lys
 130 135 140

ctg aaa aat agt ctt aat ata gcc ttg gga gga ttt gag cct agt ttt 662
 Leu Lys Asn Ser Leu Asn Ile Ala Leu Gly Gly Phe Glu Pro Ser Phe
 145 150 155

gat att aac atg ggc caa gct agt gct ctt ggt ttt gga ctg tct ttc 710
 Asp Ile Asn Met Gly Gln Ala Ser Ala Leu Gly Phe Gly Leu Ser Phe
 160 165 170

aaa aaa agc tat taa ttttatttat ctagaaaatg ggtg 749
 Lys Lys Ser Tyr
 175

<210> 23
 <211> 177
 <212> PRT

<213> Borrelia garinii

<400> 23

Met Asn Lys Phe Leu Ile Phe Ile Leu Val Ile Phe Cys Ala Phe Ser
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Ser Phe Ala Gln Asp Asp Ser Lys Ser Thr Phe Asn Leu Gly Ala Gly
20 25 30
Glu Lys Phe Leu Val Tyr Glu Thr Asn Lys Lys Asp Ser Leu Val Pro
35 40 45
Phe Leu Leu Asn Leu Phe Leu Gly Phe Gly Ile Gly Ser Phe Ala Gln
50 55 60
Gly Asp Ile Leu Gly Gly Ser Leu Ile Leu Gly Phe Asp Ala Val Gly
65 70 75 80
Ile Gly Leu Ile Leu Thr Gly Ala Tyr Leu Asp Ile Lys Asp Phe Asp
85 90 95
Asn Asn Ala Lys Lys Ala Asp Phe Lys Trp Thr Trp Gly Lys Gly Met
100 105 110
Met Leu Ala Gly Val Val Thr Met Ala Val Thr Arg Leu Thr Glu Ile
115 120 125
Val Leu Pro Phe Thr Phe Ala Asn Asn Tyr Asn Arg Lys Leu Lys Asn
130 135 140
Ser Leu Asn Ile Ala Leu Gly Gly Phe Glu Pro Ser Phe Asp Ile Asn
145 150 155 160
Met Gly Gln Ala Ser Ala Leu Gly Phe Gly Leu Ser Phe Lys Lys Ser
165 170 175
Tyr

<210> 24

<211> 32

<212> DNA

<213> Borrelia burgdorferi

<400> 24

ttggcaggta cctgtgtttt ttctagcttt gc

32

<210> 25

<211> 32

<212> DNA

<213> Borrelia burgdorferi

<400> 25

cacccatttt ctagataaat aaaattaata gc

32

<210> 26

<211> 33

<212> DNA

<213> Borrelia burgdorferi

<400> 26

ataaaaaggta ~~ccatagcttt~~ ttttgaaaga cag

33

<210> 27

<211> 32

<212> DNA

<213> Borrelia burgdorferi

<400> 27

ttggcagaat tctgtgtttt ttctagcttt gc

32

<210> 28

<211> 21

<212> DNA

<213> Borrelia burgdorferi

<400> 28

tcttttctgc agtcaccgtc g

21

<210> 29

<211> 30

<212> DNA

<213> Borrelia burgdorferi

<400> 29

ttgcttacag aattcgctgg gcgaaacgaa

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<210> 30

<211> 396

<212> DNA

<213> Borrelia burgdorferi

<220>

<221> CDS

<222> (109) .. (395)

<400> 30

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cgctaattatt ttacttgtca aaacttacca ttaggagata ataaaaac atg aaa aaa 117

Met Lys Lys

1

att ttc aca tta ata tta att ttt ggg ttg aca att gaa atc ttt gcc 165
 Ile Phe Thr Leu Ile Leu Ile Phe Gly Leu Thr Ile Glu Ile Phe Ala
 5 10 15

aca aaa gac aca caa aat aga att gaa aaa ggc att gaa agt ttt aac 213
 Thr Lys Asp Thr Gln Asn Arg Ile Glu Lys Gly Ile Glu Ser Phe Asn
 20 25 30 35

aaa tat gat aaa gag aaa aaa aat cca ata ggg cca ttc ctt tta aat 261
 Lys Tyr Asp Lys Glu Lys Lys Asn Pro Ile Gly Pro Phe Leu Leu Asn
 40 45 50

tta ttt ttg ccc ttt gga ata gga tcc ttt gtc caa ggg gat tat att 309
 Leu Phe Leu Pro Phe Gly Ile Gly Ser Phe Val Gln Gly Asp Tyr Ile
 55 60 65

ggc gga ggc tca gtg ctt gga ttt aat tta tta gga gca atc ctt tgg 357
 Gly Gly Gly Ser Val Leu Gly Phe Asn Leu Leu Gly Ala Ile Leu Trp
 70 75 80

gaa ctg gaa tta ttc tta atc acc gag aaa cac aat taa 396
 Glu Leu Glu Leu Phe Leu Ile Thr Glu Lys His Asn
 85 90 95

<210> 31

<211> 95

<212> PRT

<213> Borrelia burgdorferi

<400> 31

Met Lys Lys Ile Phe Thr Leu Ile Leu Ile Phe Gly Leu Thr Ile Glu
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 20 25 30
 Ser Phe Asn Lys Tyr Asp Lys Glu Lys Lys Asn Pro Ile Gly Pro Phe
 35 40 45
 Leu Leu Asn Leu Phe Leu Pro Phe Gly Ile Gly Ser Phe Val Gln Gly
 50 55 60
 Asp Tyr Ile Gly Gly Gly Ser Val Leu Gly Phe Asn Leu Leu Gly Ala
 65 70 75 80
 Ile Leu Trp Glu Leu Glu Leu Phe Leu Ile Thr Glu Lys His Asn
 85 90 95